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## OYSTERS: A REVIEW OF IGNORANCE.

ONE of the greatest services which science is doing for the world is the exposure of ignorance, and the inculcation of the doctrine that a thorough groundwork of the rudiments of general science should be laid by those who aspire to teach or to practice medicine, and it should be appreciated by the public that those alone who possess it are worthy of confidence.

In illustration of the actuality of the need, and partly as a review of the question concerned, I will criticise a leading article contained in a journal called *Modern Medicine and Bacteriological Review*, which purports to show that the oyster must be abandoned as a food.

This article begins by reciting the plenteousness of bacteria in the oyster, and says it is "a creature whose diet consists of the offal of the ocean, and which lives upon material so filthy and noxious in character that it requires the unceasing activity of a liver constituting nearly one-half the bulk of its body to protect it from impending death." It then cites the cases of typhoid fever traced to the oyster, quoting the *British Medical Journal*, which comments on the need for supervising the oyster beds; and then the editorial remarks that the beds are usually seated in the mouths of rivers and bays: "The oyster is fond of typhoid bacilli; it eats them as a tidbit; it will not miss a chance of swallowing millions of these mischief-making germs if opportunity is afforded. Indeed, this is the very business for which nature designed the oyster. It feasts upon the slime and ooze which covers the ocean's bed, near the shore, and the seaweeds which grow in such localities. The oyster has neither teeth nor claws with which to tear and masticate solid food. It is designed to live on the decomposing germ-infected substances which, with its filmy beard, it wipes off the slime-covered weeds and stones which abound in oyster beds."

The writer of this screed, posing as a bacteriologist and zoologist, seems to be ignorant alike of both sciences. We can here get an idea of the amount of harm which can be done by *soi disant* teachers through the medium of alleged scientific journals.

It is in the first place evident that this writer is ignorant of zoology. He does not know how

the oyster feeds; he thinks it wipes its food off the weeds with its beard! I have seen some individuals use their beards for dinner napkins, but the oyster's is truly useful; it is fork and spoon, too, it appears! Every student of natural history should know that the oyster's beard or ctenidia is his gills; that he feeds by drawing a current of water by ciliary action mainly of the ctenidia into his mouth and lives on the solid particles which are contained in the water, and that the so-called liver is a digestive gland.

Furthermore, the oyster is plainly not designed by nature for a scavenger. His natural habitat is on a clean rocky bottom, and not in the mouth of a river, as fresh water is injurious to him, consequently he cannot live on slime and ooze. When oysters are 'parked' into a muddy or even a sandy bed they do not thrive at all.

After this display of biological ignorance one wonders if the writer, presumably a doctor, can tell a mollusc from a worm.

Now, as to the bacteriology of the matter, it is plain that if the oyster feeds on typhoid bacilli he must assimilate them, and when living things are digested they generally die during the process, consequently when we eat an oyster we do not eat live bacilli. But they can live in the stomach and gut a long time, also other enteric parasites.

It is an unquestionable fact that typhoid fever could not be caused by the introduction of any number, even millions, of dead bacilli into the human body, but, at the most, some temporary illness from the ptomaines in the mixture.

Finally, the 'Medical Progress and so forth' assumes that the oyster's large liver, which, as stated above, is not homologous to the liver, is a poison trap. I was not aware that this was the main function of an hepatic cell. Plainly, the primary deduction from a large liver would be that metabolic processes were complex and that nutriment needed to be stored in large quantity. The oyster's liver, however, does not seem much different from those of his congeners.

All this sensational essay of ignorance will doubtless be reproduced by the small-fry medical journals and the daily press. It must contribute toward hurting the oyster industry. It

must result in many invalids being deprived of a luscious and digestible food, and last, but not least, help to belittle science by reasoning which the common sense of centuries shows to be absurd.

Contrast all this with the calm attitude of the scientific *British Medical Journal*, which contents itself, according to the quotation from it, with calling for scientific investigation of the reason for some beds being polluted.\* It seems quite likely that isolated oyster beds might be contaminated with bacilli, but the natural history of the oyster shows that he could not exist under such conditions, and that the bed would die out. In fact, the danger will apparently regulate itself.

I hope that these remarks will draw the attention of practical biologists, competent to set the question at rest; at the same time they will serve to show the great need of at least an elementary knowledge of science among our doctors before they presume to settle questions of the food supply of mankind; and they will serve to show the great lack of that knowledge among the rank and file of practitioners, who, at any rate, 'out west,' appear rather to glory in it.

GEORGE CHAS. BUCHANAN.

#### CEREBRAL LIGHT.

IN darkness or with closed eyes we can always see irregular forms of light in our visual field. These forms are of various kinds, series of waves, successive rings that spread and break, etc. In addition to these definite figures there is always more or less definite irregular illumination over the whole field. These phenomena are generally called the 'retinal light' or the '*Eigenlicht* of the retina.' They are usually supposed to arise from chemical changes going on in the retina. I wish to record some observations that apparently prove them to be cerebral and not retinal processes.

1. With closed eyes there is only one illuminated field, not two, as there should be from the two retinas if the light were retinal. Two retinal figures might appear as one under the

\* Cf. The investigations by Professor Conn, of Wesleyan University, and of Professor Herdman, of Liverpool College.

conditions: (a) Of suppression of one field, which is not the case here, because it is impossible to keep one field suppressed for many minutes, whereas I have watched the retinal figures in uninterrupted continuance for a long time; (b) of perfect identity of form, which is hardly a possible supposition in the case of these irregular, volatile, chemical phenomena; (c) of sufficiently similar construction for union by stereoscopic vision, which also is not the case, as there is no relief effect in the picture.

2. The figures do not change in position when the eye is moved. They are localized in front and remain in the same place, even if the eyes are directed to one side. I find, however, that if the eyes are turned to a new position and kept there, the central figure (a spreading violet circle with a phosphorescent rim) will soon afterwards follow the movement; there is thus a tendency for this figure to occupy the spot of sharpest vision.

3. The figures do not change in location when the eyes are displaced. When the eyes are looking at some definite object, *e. g.*, this page, a pressure of the finger on one of them will cause the page apparently to move. This is true whether the other eye is open or closed. Likewise, if an after-image is obtained, it will move upon pressure of the eyeball. The pressure displaces the eyeball and changes the projection of the retinal picture. This displacement does not occur with 'retinal light.' I have repeatedly observed these figures and have manipulated the eyeballs; I have found that they are not in the slightest degree affected by the manipulations. In order to avoid all possibility of errors of observation, I have made the experiments in a series alternately with eyes open and eyes closed. With the eyes open I observed a dimly illuminated window; with them closed I saw the 'retinal' figures. The former always followed the displacements, the latter never.

These observations are, I believe, sufficient to establish the proposition (which I have not seen elsewhere) that the phenomena of vision usually known as 'retinal light' and 'retinal figures' are not originated in the retina, but in the brain. They should therefore be termed 'cerebral light' and 'cerebral figures.'

The following hypothesis seems also justified: